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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/823,030	04/13/2004	Patrick C. Fenton	16437-0209U	3385

24267 7590 04/15/2008

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EXAMINER	
NGUYEN, LEON VIET Q	

ART UNIT	PAPER NUMBER
2611	

MAIL DATE	DELIVERY MODE
04/15/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/823,030	FENTON, PATRICK C.	
	Examiner	**Art Unit**	
	LEON-VIET Q. NGUYEN	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 February 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-40* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *10-31* is/are allowed.

6)☒ Claim(s) *1-4,8,9,32-34,37,38 and 40* is/are rejected.

7)☒ Claim(s) *5-7,35,36 and 39* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *13 April 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *2/4/08*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 2/4/08 has been entered.

Information Disclosure Statement

2. The information disclosure statement (IDS) submitted on 2/4/08 was filed after the mailing date of 2/4/08. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lorenz et al (US5134407) in view of Medlock (US20060018371).

Re claim 1, Lorenz teaches a pre-correlation filter for a receiver that receives spread-spectrum signals, the filter including:

an array of complex accumulation registers (accumulators 151 and 155 in fig. 4) that over multiple code chips accumulate measurements that correspond to samples of the received signal (col. 9 line 63 – col. 10 line 4, L1 and L2 are interpreted to be the received signals), the accumulation registers being associated with code chip ranges that spans a code chip (col. 9 line 63 – col. 10 line 4, the A-code is interpreted to be the code chip range);

a code phase decoder (carrier generators 107 and 109 in fig. 4) that controls the respective complex accumulation registers to direct respective measurements to the complex accumulation registers that are associated with the code chip ranges from which the samples are taken, the code phase decoder decoding values that correspond to the estimated code phase angles of the sample (col. 9 lines 7-22 and col. 13 lines 22-34, the replica of the L1 and L2 signals are interpreted to be estimates of the signals. Furthermore it is well known in the art that in spread spectrum communications, distinct codes are used to differentiate phase angles of each portion of a signal).

Lorenz fails to teach wherein each accumulation register is associated with a code chip range that span only a portion of a code chip and producing a sum that corresponds to the associated code chip range. However Medlock teaches accumulation registers (Add and Accumulate blocks 225 in fig. 2A) associated with a code chip range that span only a portion of a code chip (¶0008, ¶0027, the sub-chips

which are a fraction of a chip) and producing a sum that corresponds to the associated code chip range (¶0036-¶0037).

Therefore taking the combined teachings of Lorenz and Medlock as a whole, it would be obvious to one of ordinary skill in the art at the time the invention was made to incorporate the features of Medlock into the filter of Lorenz. The motivation to combine Medlock and Lorenz would be to significantly reduce “miss” probability (¶0027).

5. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lorenz et al (US5134407) in view of Kohli et al (US6466612).

Re claim 1, Lorenz teaches a pre-correlation filter for a receiver that receives spread-spectrum signals, the filter including:

an array of complex accumulation registers (accumulators 151 and 155 in fig. 4) that over multiple code chips accumulate measurements that correspond to samples of the received signal (col. 9 line 63 – col. 10 line 4, L1 and L2 are interpreted to be the received signals), the accumulation registers being associated with code chip ranges that spans a code chip (col. 9 line 63 – col. 10 line 4, the A-code is interpreted to be the code chip range);

a code phase decoder (carrier generators 107 and 109 in fig. 4) that controls the respective complex accumulation registers to direct respective measurements to the complex accumulation registers that are associated with the code chip ranges from

which the samples are taken, the code phase decoder decoding values that correspond to the estimated code phase angles of the sample (col. 9 lines 7-22 and col. 13 lines 22-34, the replica of the L1 and L2 signals are interpreted to be estimates of the signals. Furthermore it is well known in the art that in spread spectrum communications, distinct codes are used to differentiate phase angles of each portion of a signal).

Lorenz fails to teach wherein each accumulation register is associated with a code chip range that span only a portion of a code chip and producing a sum that corresponds to the associated code chip range. However Kohli teaches accumulation registers (summers 84 in fig. 3) associated with a code chip range that span only a portion of a code chip (col. 12 lines 36-49) and producing a sum that corresponds to the associated code chip range (col. 13 lines 13-17, col. 14 line 64-col. 15 line 10).

Therefore taking the combined teachings of Lorenz and Kohli as a whole, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the features of Kohli into the method of Lorenz. The motivation to combine Kohli and Lorenz would be to accurately maintain the synchronization of prompt correlation (col. 2 lines 15-17).

6. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lorenz et al (US5134407) and Medlock (US20060018371) in view of Stansell, Jr. (US5963582).

Re claim 2, the modified invention of Lorenz fails to teach a pre-correlation filter wherein the code chip ranges covering a rising edge of the code chip are smaller than the code chip ranges covering other sections of the code chip. However Stansell, Jr. teaches the leading edge of a code chip being smaller than other sections of the code chip (fig. 36G, col. 43 lines 15-17).

Therefore taking the modified teachings of Lorenz and Medlock with Stansell, Jr. as a whole, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the smaller leading edge of a code chip of Stansell, Jr. into the pre-correlation filter of Lorenz and Medlock. The motivation to combine Medlock, Stansell, Jr. and Lorenz would be to simplify the logic (col. 43 lines 18-19).

7. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lorenz et al (US5134407) and Medlock (US20060018371) in view of Zhengdi (US6751247).

Re claim 3, the modified invention of Lorenz fails to teach a pre-correlation filter wherein the code chip ranges are adjustable. However Zhengdi teaches changing a code chip frequency, interpreted to be the code chip range, according to the duration in time of the spreading code and according to the chip length (col. 4 lines 29-33).

Therefore taking the modified teachings of Lorenz and Medlock with Zhengdi as a whole, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the adjustable code chip frequency of Zhegdi into the pre-correlation filter of Lorenz and Medlock. The motivation to combine Zhengdi,

Medlock and Lorenz would be to reduce correlation between the spreading codes (col. 4 lines 33-34) and detect the signal better (col. 4 line 41).

8. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lorenz et al (US5134407) and Medlock (US20060018371) in view of Harms et al (US6493376).

Re claim 4, the modified invention of Lorenz fails to teach a pre-correlation filter wherein the sizes, numbers and starting points of the code chip ranges are selectively varied. However, in ¶0049 of applicant's specification, varying of the length, number, and/or starting position of the ranges is achieved by changing the code offset values associated with the accumulators.

Harms teaches an accumulator which generates the correlation of the data at each possible local PN code offset time (col. 24 lines 2-5). Although not explicitly stated, one of ordinary skill in the art would have found it obvious and necessary to change the code offset values corresponding to the code offset times.

Therefore taking the modified teachings of Lorenz and Medlock with Harms as a whole, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the changing of code offset values of Harms into the pre-correlation filter of Lorenz and Medlock. The motivation to combine Harms, Medlock and Lorenz would be to differentially detect phase shifts between consecutive accumulated signals (col. 6 lines 8-12).

9. Claims 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lorenz et al (US5134407) and Medlock (US20060018371) in view of Fenton et al (US5390207).

Re claim 8, the modified invention of Lorenz fails to teach a pre-correlation filter wherein the respective complex accumulation registers include inphase registers that collect measurements that correspond to inphase samples and quadrature phase registers that collect measurements that correspond to quadrature samples. However, Fenton teaches wherein the respective complex accumulation registers include inphase registers (register 244i in fig. 6) that collect measurements that correspond to inphase samples and quadrature phase registers (register 244q in fig. 6) that collect measurements that correspond to quadrature samples.

Therefore taking the modified teachings of Lorenz and Medlock with Fenton as a whole, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the inphase and quadrature registers of Fenton into the pre-correlation filter of Lorenz and Medlock. The motivation to combine Fenton, Medlock and Lorenz would be to perform low frequency filtering (col. 10 lines 56-57), which is well known in the art to reduce noise.

Re claim 9, the modified invention of Lorenz fails to teach a pre-correlation filter wherein the accumulated measurements from the array of complex accumulators are compared with a predetermined reference shape to detect the presence or absence of interfering signals. However Fenton teaches wherein the array of complex

accumulation values (col. 10 lines 56-57, the I_D and Q_D data) are compared with a predetermined reference shape (col. 10 lines 56-57, the low frequency filtering function is interpreted to be the reference shape).

Therefore taking the modified teachings of Lorenz and Medlock with Fenton as a whole, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the comparison method of Fenton into the pre-correlation filter of Lorenz and Medlock. The motivation to combine Fenton, Medlock and Lorenz would be to perform low frequency filtering (col. 10 lines 56-57), which is well known in the art to reduce noise.

10. Claims 32 and 37 are rejected under 35 U.S.C. 102(b) as being unpatentable over Underbrink et al (US20050025222) in view of Medlock (US20060018371).

Re claim 32, Underbrink teaches a method of producing measurement pulse shapes associated with code chips of a PRN code in a received signal, the method including the steps of:

over multiple PRN code chips (¶0013, “one of the PN code chips” it is interpreted to mean that there is more than one code chip) taking measurements that correspond to samples of the received signal (¶0013, the selected portion of the signal sample is interpreted to be a measurement corresponding to that sample); and

selectively combining the measurements into ranges that span a code chip (¶0013, the adder adding the first and second product which corresponds to the measurements from the first and second signal samples), the ranges being based on estimated code phase angles of the samples (¶0014. Underbrink teaches that each pair

of signal samples has an in-phase and quadrature-phase portion, which is well known to have a phase angle. Therefore it is interpreted that the range is based on the phase angles. Furthermore it is well known in the art that in spread spectrum communications, distinct codes are used to differentiate phase angles of each portion of a signal).

Underbrink fails to teach wherein each of the respective respective ranges which span only a portion of a code chip. However Medlock teaches utilizing a code chip range that span only a portion of a code chip (¶0008, ¶0027, the sub-chips which are a fraction of a chip).

Therefore taking the modified teachings of Unerbrink and Medlock as a whole, it would be obvious to one of ordinary skill in the art at the time the invention was made to incorporate the features of Medlock into the method of Underbrink. The motivation to combine Medlock and Underbrink would be to significantly reduce “miss” probability (¶0027).

Re claim 37, the modified invention of Underbrink teaches a method wherein the step of taking measurements includes taking measurements that correspond to inphase samples and quadrature samples (¶0013 - ¶0014, the selected portion of the signal sample is interpreted to the measurements and each signal sample includes an in-phase and quadrature-phase portions).

11. Claims 33 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Underbrink et al (US20050025222) and Medlock (US20060018371) in view of Sanderford et al (US5764686).

Re claim 33, the modified invention of Underbrink fails to teach a method further including the step of determining an estimated location of the chip edges in a direct path signal. However Sanderford teaches correlation peak information which comes from a portion of a chip time or a whole chip time (col. 4 lines 48-52) to estimate a leading edge of the correlation function (col. 4 lines 50-52). The correlation function is interpreted to be the direct path signal.

Therefore taking the modified teachings of Underbrink and Medlock with Sanderford as a whole, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the edge determining method of Sanderford into the method of Underbrink and Medlock. The motivation to combine Underbrink, Medlock and Sanderford would be to shorten the dwell time required when taking additional samples of the leading edge of a correlation function (col. 5 lines 35-39).

Re claim 34, the modified invention of Underbrink teaches a method further including the step of narrowing the ranges that are associated with the chip edges (col. 1 lines 43-46, the chip time is interpreted to be the chip range).

12. Claim 38 is rejected under 35 U.S.C. 103(a) as being unpatentable over Underbrink et al (US20050025222) and Medlock (US20060018371) in view of Kohli et al (US6466612).

Re claim 38, the modified invention of Underbrink fails to teach a method wherein the step of combining further includes combining the measurements to produce one or more early correlation values and one or more late correlation values for use in correlating a local PRN code to the received PRN code and a local carrier to a received carrier. However Kohli teaches combining the measurements to produce one or more early correlation values and one or more late correlation values (col. 17 lines 25-28) for use in correlating a local PRN code to the received PRN code and a local carrier to a received carrier (col. 1 line 66 – col. 2 line 17).

Therefore taking the modified teachings of Underbrink and Medlock with Kohli as a whole, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the production and use of early and late correlation values of Kohli into the method of Underbrink and Medlock. The motivation to combine Underbrink, Medlock and Kohli would be to accurately maintain the synchronization of prompt correlation (col. 2 lines 15-17).

13. Claim 40 is rejected under 35 U.S.C. 103(a) as being unpatentable over Underbrink et al (US20050025222) and Medlock (US20060018371) in view of Fenton et al (US5390207).

Re claim 40, the modified invention of Underbrink fails to teach a method further including the step of comparing the combined measurements with a predetermined reference shape to detect the presence or absence of interfering signals. However Fenton teaches comparing the combined measurements (col. 10 lines 43-48, the I_D and Q_D data coming from the addition of two measurements as seen in the equations) with a predetermined reference shape (col. 10 lines 56-57, the low frequency filtering function is interpreted to be the reference shape).

Therefore taking the modified teachings of Underbrink and Medlock with Fenton as a whole, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the comparison method of Fenton into the method of Underbrink and Medlock. The motivation to combine Fenton, Medlock and Underbrink would be to perform low frequency filtering (col. 10 lines 56-57), which is well known in the art to reduce noise and interference.

Allowable Subject Matter

1. Claims 5-7, 35, 36, and 39 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

2. Claims 10-31 are allowed.

3. The following is an examiner's statement of reasons for allowance: the allowable subject matter in claims 10 and 21 pertain to a pre-correlation filter that includes an array of complex accumulation registers that collect measurements that correspond to

samples of the received signal, the accumulation registers being associated with code chip ranges that span all or a portion of a code chip; a code phase decoder that controls the complex accumulation registers to direct the measurements to the respective complex accumulation registers that are associated with the code chip ranges from which the associated samples are taken, the code phase decoder decoding values that correspond to the estimated phase angles of the samples; and a multipath mitigation processor that uses the measurements collected by the complex accumulation registers to produce code multipath error signals and carrier multipath error signals.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled “Comments on Statement of Reasons for Allowance.”

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LEON-VIET Q. NGUYEN whose telephone number is (571)270-1185. The examiner can normally be reached on monday-friday, alternate friday off, 7:30AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner’s supervisor, David C. Payne can be reached on 571-272-3024. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Leon-Viet Q Nguyen/
Examiner, Art Unit 2611

/David C. Payne/

Supervisory Patent Examiner, Art Unit 2611